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CONTENTS/SUMMARIES

Summary: Bacillus subtilis sporulation is an adaptive response to nutritional stress and involves the differential development of two cells. In the last 10 years or so, virtually all of the regulatory genes controlling sporulation, and many genes directing the structural and morphological changes that accompany sporulation, have been cloned and characterized. This review describes our current knowledge of the program of gene expression during sporulation and summarizes what is known about the functions of the genes that determine the specialized biochemical and morphological properties of sporulating cells. Most steps in the genetic program are controlled by transcription factors that have been characterized in vitro. Two sporulation-specific sigma factors, σ^E and σ^F, appear to segregate at septation, effectively determining the differential development of the mother cell and prespore. Later, each σ is replaced by a second cell-specific sigma factor, σ^K in the mother cell and σ^G in the prespore. The synthesis of each sigma factor is tightly regulated at both the transcriptional and posttranslational levels. Usually this regulation involves an intercellular interaction that coordinates the developmental programmes of the two cells. At least two other transcription factors fine tune the timing and levels of expression of genes in the σ^E and σ^K regulons. The controlled synthesis of the sigma factors and other transcription factors leads to a spatially and temporally ordered program of gene expression. The gene products made during each successive stage of sporulation help to bring about a sequence of gross morphological changes and biochemical adaptations. The formation of the asymmetric spore septum, engulfment of the prespore by the mother cell, and formation of the spore core, cortex, and coat are described. The importance of these structures in the development of the resistance, dormancy, and germination properties of the spore is assessed.

Summary: Lipopolysaccharides (LPS) are surface components of the outer membrane of Neisseria meningitidis. Today, 12 different types of meningococcal LPS (immunotypes) are known, of which 3 are prevalent in the western world. The differences between these immunotypes are in the oligosaccharide part of the LPS molecule and consist of small differences in the oligosaccharide structure, the amount and location of phosphoethanolamine groups, and the degree of O acetylation of individual monosaccharides. Although the differences between the various immunotypes are small, they have a profound influence on the immunochemical and immunological properties of these molecules. Furthermore, each individual strain synthesizes a number of different

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